The Egg and Hatchling of the Suwannee Terrapin

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In the more than three decades since its original description (Carr, 1937), surprisingly little information concerning the natural history of the Suwannee terrapin, *Pseudemys concinna suwanniensis* has been accumulated. Apparently, the only published data regarding its reproductive biology are those of Marchand (1944) who observed part of the courtship procedure in the field.

While studying growth rate in this form, information was accumulated over a three-year period relating to the eggs and hatchlings of several females. These females were all from the Marion and adjacent counties area of Florida near the central portion of the geographic range of the subspecies, quite distantly removed from the area where intergradation with *P. c. mobiliensis* occurs.

The information presented herein is based on observations made of 3 groups of eggs and 3 groups of hatchlings. Linear measurements were made to the nearest 0.1 mm with a vernier caliper. Egg weights were determined to the nearest 0.1 gram.

Eggs were incubated in the laboratory at room temperature. A photograph of 3 eggs is shown as Fig. 1. Data pertaining to the 3 egg groups are given in Table 1. It was necessary to use the term "group" since some eggs were received from a commercial fisherman on two occasions who had pooled them from several females being butchered for the market. However, intact clutches were obtained from 3 females, and contained 17, 17, and 19 eggs. Egg groups are designated by dates which refer to the time at which incubation began.

In shape, the egg is regularly ellipsoidal, with a very fine granular texture and a faint, pinkish-white, dull coloration. The shell is quite flexible and parchment-like. Incubation periods for the 3 groups of eggs are as follows: Sept. 12: 84-87 days; Apr. 21: 88-92 days; May 22: 84-86 days. Percentages of eggs hatching in the 3 groups were respectively: 47.0, 73.3, and 91.3.

Upon emerging from the shells, all hatchlings retained yolk sacs whose widths varied from 12.8 mm to 6.2 mm. Within a week, the sacs had been retracted through the "umbilical" area

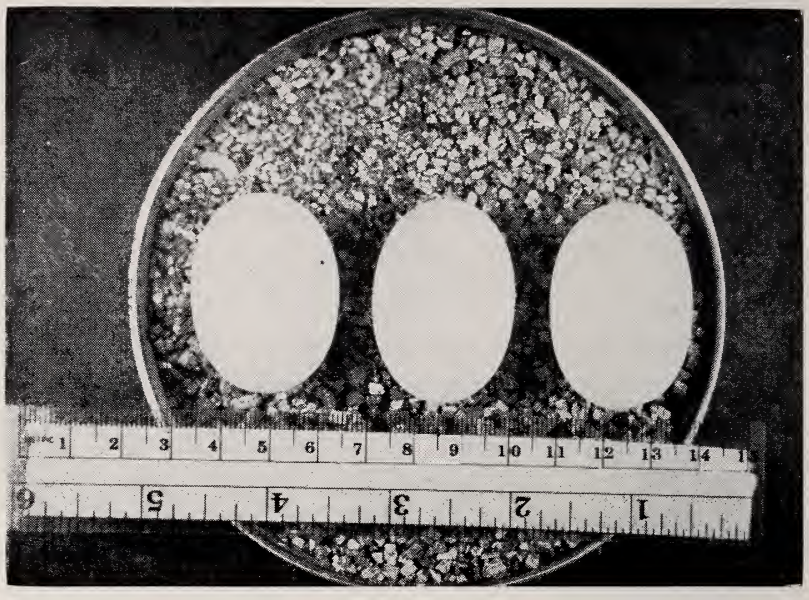

Fig. 1. Eggs of *Pseudemys concinna suwanniensis*.

of the plastron. Loss of the caruncle (egg "tooth") occurred in from 8 to 17 days, averaging 11 days.

One group of hatchlings (Sept. 12) was measured immediately after hatching, two groups (Sept. 12, Apr. 29) at one week post-hatching, and one group (May 22) after preservation. Slight increase in linear dimensions is revealed in the one week post-hatching measurements, due to "unrolling" of the turtle. Otherwise, differences are slight under various conditions. Hatchling groups are designated by dates which refer to the time at which incubation of their eggs began. Data pertaining to the 3 hatchling groups are given in Table 2.

Color descriptions based on the May 22 group were made after preservation in alcohol at age one week. Color designations are from Maerz and Paul (1930) and are as follows: ground color of carapace, yellow green (13G2) with numerous brownish-green (16E4) blotches. Rim of carapace, yellow (10E1). Ground color of plastron, citron (10I2) with seam-following pattern of gray-brown (15A1). Ground color of head and limbs, kangaroo (16C6), with yellow-gray (20B1) stripes. These data represent modal

TABLE 1

Egg data of *Pseudemys concinna suwanniensis*

Date		Range	M ± s.e.	V
Sept. 12 (N=17)	Weight (g)	22.4-16.4	19.9±.32	6.6
	Length (mm)	43.3-38.8	41.3±.26	2.6
	Width (mm)	30.5-27.5	28.9±.15	2.1
Aug. 5 (N=19)	Weight (g)	—	—	—
	Length (mm)	40.8-32.9	36.1±.54	6.5
	Width (mm)	27.7-24.4	26.0±.19	3.2
Apr. 29 (N=36)	Weight (g)	—	—	—
	Length (mm)	42.7-35.5	39.4±.42	6.4
	Width (mm)	27.6-25.8	26.1±.15	3.3

colorations, although slight variations do occur. A dorsal keel is present on the first, second, third, and fourth central laminae (scutes) and is best developed on the second and third. Greatest height of carapace is at the second central lamina. The upper surface of each marginal possesses a yellow vertical bar which intersects another yellow bar at the distal edge of marginal. Ocellated blotches on lower surface of marginals are concentrically double, and bisected by marginal seams. The bridge possesses a dark longitudinal bar, the width of which is highly variable. Striping of the side of the head and throat is within the range of variation described for the adult (Carr, 1937).

Immediately upon hatching and for 3 to 4 days thereafter, the coloration and pattern of markings is somewhat different from that of the week-old May 22 specimens described above. The immediate post-hatching coloration and pattern of living specimens in the Sept. 12 group is as follows: ground color of carapace is light gray (31A2) with numerous dark gray (16A1) blotches, the central portions of which are slightly lighter. Ground color of the plastron is yellow (10E1) with a seam-following pattern of black. There are usually 7 (2 very faint) yellowish (10L1) lines between the eyes. Lines on the outer surface of fore and hind limbs are generally 5 in number and the same color as head stripes. Ground color of the head and limbs is dull black. Very close inspection of newly-hatched individuals reveals an extremely faint carapace

TABLE 2
Hatchling measurements at one week post-hatching

	Sept. 12* (N=8)			Apr. 29 (N=30)			May 22 (N=16)		
	Range	M ± s.e.	V	Range	M ± s.e.	V	Range	M ± s.e.	V
Carapace	37.1-35.7	36.2±.18	1.4						
length (mm)	38.9-37.1	38.0±.20	1.5	36.5-32.7	35.0±.16	2.4	38.3-35.1	37.0±.19	2.1
Carapace	34.3-30.2	31.7±.63	5.6						
width (mm)	36.7-35.1	35.8±.18	1.4	35.4-26.3	29.8±.35	6.4	38.0-33.8	35.7±.28	3.2
Plastron	34.0-31.5	32.9±.23	2.0						
length (mm)	35.3-32.7	34.1±.24	2.0	33.8-29.2	31.7±.19	3.3	34.4-31.5	33.0±.19	2.3
Anterior	21.0-20.2	20.5±.10	1.3						
Plastron									
width (mm)	20.6-20.1	20.4±.06	0.8	20.1-18.3	19.2±.08	2.1	20.6-19.2	19.9±.10	2.0
Posterior	19.7-17.9	18.8±.20	3.1						
Plastron									
width (mm)	19.6-18.2	18.7±.16	2.4	19.5-17.5	18.2±.09	2.8	20.4-18.3	19.2±.14	2.9
Bridge	11.8-10.9	11.3±.10	2.6						
width (mm)	12.1-11.1	11.6±.12	2.8	11.4- 9.1	10.4±.10	5.3	11.9-10.3	11.3±.11	3.8
Shell	21.7-20.9	21.1±.13	1.7						
thickness (mm)	21.8-20.3	20.9±.16	2.2	21.4-18.2	20.2±.13	3.8	20.9-19.4	20.5±.14	2.6
Weight (g)	12.6-11.4	11.9±.12	2.8						
	—	—	—	13.8-10.4	12.4±.16	6.9	—	—	—

*First line measurements (only) made immediately post-hatching for Sept. 12 group.

reticulum of yellow (10J5) lines showing slightly through the post-hatching pattern.

The post-hatching pattern begins to fade from the carapace laminae after about 3 days. At about 10 to 12 days, the typical juvenile reticulum is prominent, the carapace ground color has become greenish, and the "C"-shaped marking of the second lateral lamina (diagnostic for *P. concinna* species) is discernible. The dark gray post-hatching carapace blotches shrink steadily and disappear after about 4 weeks.

It is of interest to note that the change in coloration and pattern is due to a progressive fading of pigmentation in the carapace laminae. As the pigmentation disappears, the laminae become translucent, allowing the juvenile coloration and pattern in the underlying Malpighian layer to show through. Figure 2 shows lateral and ventral views of a preserved individual at 1 week of

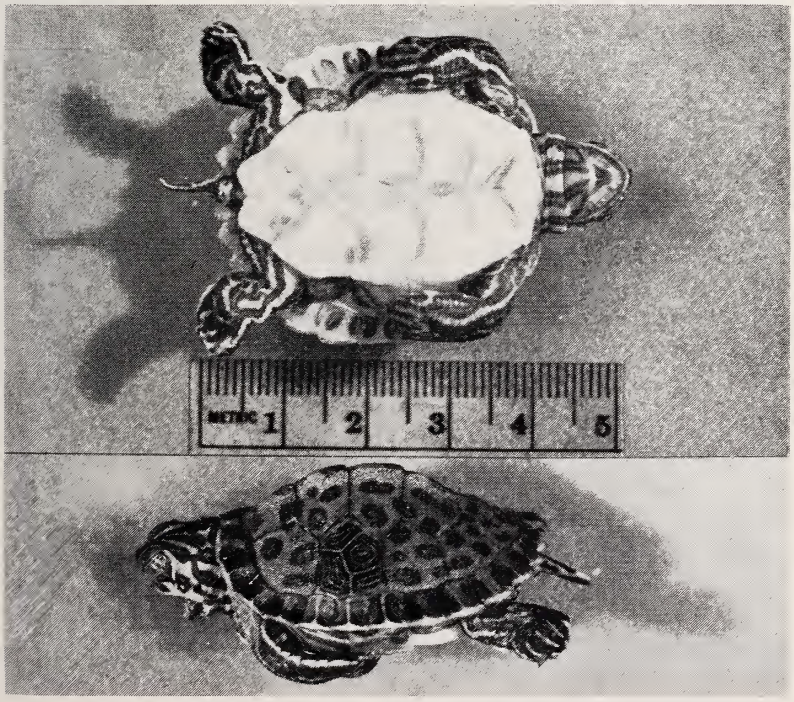

Fig. 2. Hatchling of *Pseudemys concinna suwanniensis*: second lateral lamina and adjacent marginals removed.

age in which the second lateral lamina and 3 adjacent marginal laminae have been removed.

Specimens which were preserved have been deposited in the Mississippi State College for Women Collections (MSCW 10168-10183).

Appreciation is expressed to Mr. Joseph Wilder who supplied two groups of eggs and associated field data. Mr. Calvin Shanks kindly photographed the hatchlings. Financial support through a Faculty Research Grant from Mississippi State College for Women is gratefully acknowledged.

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